

Comparative study of different surgical methods for managing varicocele on 24 male patients

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Abstract

Varicocele is an abnormal dilatation, lengthening and tortuosity of the veins of the pampiniform plexus of spermatic cord. The veins ascend in three groups, as they ascend they decrease in numbers, increase in size and inters deep inguinal ring as the internal spermatic veins. A total number of 24 male adolescents with varicocele were treated at the department of surgery district hospital Rajouri (J&K) from December 2014 to October 2017. By three surgical methods viz. scrotal, inguinal and high ligation. We concluded that the inguinal (Trans inguinal method is the best form of treatment of varicocele, as it is easy, less complicated with short hospital stay. This method has marked improvement in sperm quality and testicular volume.

Keywords: varicocele, pampiniform plexus, spermatic cord, testis, sperm count, ligation

Introduction

Varicocele is the compact pack of veins filled with deoxygenated blood with abnormal dilatation lengthening and tortuosity of veins of spermatic cord.

The incidence of Varicocele in male population ranges between 8 to 23 %. These veins ascend in three longitudinal groups. The anterior or spermatic group (Varicocele), the middle or vasal group and posterior or ceramic group [2-5]. As the veins goes up from scrotum they decrease in number, increase in size, enter the inguinal ring as the internal spermatic vein [6-9]. The varicocele occur on left side in 98% of patients [10-14]. There is high degree of correlation between the grades of varicocele and its effects on testicular volume and results of varicocelectomy [15].

The reported incidence of varicocele in infertile male is as high as 30% which shows that it plays significant role in infertility. Thus this study was conducted on 24 patients for analysis treated by three modalities of the treatment of varicocele i.e. the scrotal, transinguinal and palmo's procedure (high ligation). The results of treatment were analysed with reference to effects on semen analyses, testicular size/volume, fertility outcome, pregnancy rates and complication.

The aim and objective of this study is to find the best surgical treatment possible for varicocele as it is easy, simple with short hospital stay. This method is associated with marked progress in sperm quality and testicular volume.

Results and discussion

In the present study of 24 patients with varicocele maximum number of patients 13 (54.16%) were in the age group of 14-20 years and 20 (83.3%) left testis were involved. The total of 24 patients 6 (25%) were married and out of them 4 (66.6%) were infertile. Among them 2 (50 %) who were married. Out of 4 (66.6%) have no effect on their fertility after varicocele treatment.

Pre-operative evaluation results 18 (75%) of patients with sperm count of < 50 million per ml and 7 (29.16%) with

sperm count of > 50 million per ml, 18 (75%) of patients with sperm motility of 60% motile sperm count and 6 (25%) of patients with sperm motility > 60% motile sperm and 17 (70.83%) with sperm morphology showing < 60% oval form, 7 (30%) of patients with that of > 60% of oval form. Of the 20 patients left sided varicocele testicular volume were < 15 ml. in 14 (70% of cases and > 15 ml. in 10 (41.66%) of cases. While in 4 of the right sided varicocele 3 (75%) of patients with testicular volume and 1 (25%) cases with that of > 15ml.

In our series 3 modalities of treatment are used for varicocele repair each group 8 (33.3%). Postoperative evaluation of semen analysis done at 3, 6 and 9 months revealed the results of sperm count, sperm motility and sperm morphology as shows in tables 1, 2 and 3 respectively. The number of cases with count of >50 million was statistically significant at 9 months. Also a statistically significant increase in number of cases with motility of >60% at 9 months was also seen. However, no significant improvement in sperm morphology (oval forms) was observed.

A significant change in testicular volume was noted postoperatively reaching statistical significance at 1% level. Two tailed P value (Fishers exact test) was >0.2 (in significant). The results of postoperative semen analysis in the patients operated by the three mentioned recognized surgical methods for correction of varicocele were analyzed and the results of sperm count, sperm motility and sperm morphology are shown in table 4, 5 and 6 respectively.

A statistically significant improvement (P<0.005) in sperm count (>50 million /ml) was observed in transinguinal technique only in sperm count (>50 million /ml) while a significant improvement in sperm motility (>60%) was seen in transinguinal and Palomo's procedure. No significant improvement in sperm morphology occurred with either of the 3 techniques. Out of all the 3 surgical techniques for treatment of varicocele, maximum incidence of complications was seen in scrotal method and minimum incidence in transinguinal method as shown in table 7.

Table 1: Sperm count (preoperative and postoperative)

| Sperm count | Preoperative | Postoperative | | |
|----------------------------------------------|--------------|------------------------------|------------------------------|-------------------------------|
| | No. (%) | At 3 month follow-up (No. %) | At 6 month follow-up (No. %) | At 9 months follow-up No. (%) |
| <50 million | 18 (75%) | 17 (70.83) | 14 (58.3%) | 10 (41.66%) |
| >50 million Yates corrected (x) ² | 07 (29.16%) | 8 (33.3). | 11 (45.83%) | 15 (63.5%) |
| Df | | 1 | 1 | 1 |
| P | | IS | IS | Sig. |

IS: In Significant. HS: Highly Significant.

Table 2: Sperm motility (preoperative and postoperative results)

| Sperm motility | Preoperative | Postoperative | | |
|----------------------------------|--------------|------------------------------|------------------------------|-------------------------------|
| | No (%) | At 3 month follow-up (No. %) | At 6 month follow-up (No. %) | At 9 months follow-up (No. %) |
| <60% motile | 18 (75%) | 15 (62.5) | 11 (45.83) | 8 (33.3) |
| >60% motile | 06 (25%) | 10(41.66) | 13 (54.16) | 4 (66.6) |
| Yates corrected (x) ² | | 1.23 | 4.51 | 9.7 |
| Df | | 1 | 1 | 1 |
| P | | >0.2 | >0.3 | <.002 |
| | | IS | IS | HS |

IS: insignificant, HS: Highly significant

Table 3: Sperm morphology (preoperative and postoperative results)

| Sperm count morphology % oval forms | Preoperative No. (%) | Postoperative | | |
|----------------------------------------------|----------------------|------------------------------|------------------------------|-------------------------------|
| | | At 3 month follow-up (No. %) | At 6 month follow-up No. (%) | At 9 months follow-up No. (%) |
| <60% motile | 17 (70.88%) | 18 (75%) | 17 (70.83) | 15 (62.5) |
| >60% motile Yates corrected (x) ² | 07 (29.16) | 06 (25) 0.09 | 07 (29.16) 0.08 | 10 (41.66) 0.29 |
| Df | | 1 | 1 | 1 |
| P | | >0.5 IS | >0.5 IS | >0.5IS |

Table 4: Sperm count (results of three surgical methods)

| Method | No. of patients | Preoperative Sperm count (million/ml) | | Postoperative Sperm count (million/ml) | | p. value (2-tailed Fisher's exact test) |
|----------------|-----------------|---------------------------------------|-----------|----------------------------------------|-----------|-----------------------------------------|
| | | <50 | >50 | <50 | >50 | |
| | | No. (%) | No. (%) | No. (%) | No. (%) | |
| Trans-inguinal | 8 | 07 (87.5) | 02 (25) | 01 (12.5) | 07 (87.5) | <0.005 (sig.) |
| Scrotal | 8 | 06 (75%) | 03 (37.5) | 06 (75) | 03 (37.5) | >0.09 (IS) |
| Palomo's | 8 | 06 (75%) | 03 (37.5) | 03 (37.5) | 06 (75) | >0.1 (IS) |

Sig: significant, IS: insignificant

Table 5: Sperm motility (results of the three surgical methods)

| Method | No. of patients | Preoperative Sperm count (million/ml) | | Postoperative Sperm count (million/ml) | | p. value (2-tailed Fisher's exact test) |
|----------------|-----------------|---------------------------------------|-----------|----------------------------------------|-----------|-----------------------------------------|
| | | <60 | >60 | <60 | >60 | |
| | | No.(%) | No.(%) | No.(%) | No.(%) | |
| Trans-inguinal | 8 | 07 (87.5) | 01 (12.5) | 01 (12.5) | 07 (87.5) | <001 (Sig.) |
| Scrotal | 8 | 05 (62.5) | 03 (37.5) | 05 (62.5) | 03 (37.5) | >0.09 (IS) |
| Palomo's | 8 | 06 (75) | 02 (25) | 01 (12.5) | 07 (87.5) | >0.003(Sig) |

Sig: significant, IS: insignificant

Table 6: Sperm morphology (results of the three surgical methods)

| Method | No. of patients | Preoperative Sperm count (million/ml) | | Postoperative Sperm count (million/ml) | | p. value (2-tailed Fisher's exact test) |
|----------------|-----------------|---------------------------------------|-----------|----------------------------------------|---------|-----------------------------------------|
| | | <60 | >60 | <60 | >60 | |
| | | No.(%) | No.(%) | No.(%) | No.(%) | |
| Trans-inguinal | 8 | 04 (50) | 04 (50) | 02 (25) | 06 (75) | >0.4 (IS) |
| Scrotal | 8 | 04 (50) | 04 (50) | 04 (50) | 04 (50) | >0.9 (IS) |
| Palomo's | 8 | 03 (35.5) | 05 (62.5) | 02 (25) | 06 (75) | >0.5(IS) |

Sig: significant, IS: insignificant

Table 7: Complications in relation to the method used

| Method | No. of patients | Hydrocele No. % | Scrotal Haematoma No. % | Wound Infection No. % | Varicocele Recurrence No. % | Varicocele Persistence No. % |
|----------------|-----------------|-----------------|-------------------------|-----------------------|-----------------------------|------------------------------|
| Trans-inguinal | 8 | - | - | 01 (12.5) | - | 01 (12.5) |
| Scrotal | 8 | 02 (25) | 02 (25) | 01 (12.5) | 01 (12.5) | 02 (25) |
| Palomo's | 8 | 01 (12.5) | - | 02 (25) | 01 (12.5) | 02(25) |

Conclusion

In the prospective randomized controlled study of the three methods for the correction of varicocele in the 24 patients studied in the present series, sperm analysis showed a marked improvement after varicocelectomy. Of the total number of 24 patients, 50% showed sperm count of >50 million/ ml ($p < .01$), 66.6% of the patients showed sperm motility of > 60% ($p < 0.002$) and 40% showed a morphology of >60% ($p > 0.5$). Our results are in similarity with work done by Arnold M Balker *et al* 1981^[16]. There was marked improvement in testicular volume postoperatively (77.7% of patients showed a testicular volume of > / 15ml with $p < 0.01$). Our results are in accordance with Kass and Balman 1984^[17] and Reitelman 1987^[18].

Transinguinal method was found to be the best one for correction of varicocele with fewer complications and shorter hospital stay. There was a marked improvement in sperm quality and testicular volume postoperatively by this method. Similar results were supported by Vermeulen A *et al* 1984^[19]. Similar studies were conducted by Shaikh Rasheed Mehmood *et al* in 2007 at SKIMS, Srinagar.

Scrotal method should not be usually employed for correction of varicocele because of its major complications. There was no effect on semen analysis in patients operated by this route.

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